



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/827,843	04/05/2001	Estela Ong	050-99-012 CIP1	6647

7590

05/23/2003

Honeywell International, Inc.
LAW Dept. AB2
P.O. Box 2245
Morristown, NJ 07962-9806

EXAMINER

CANTELMO, GREGG

ART UNIT

PAPER NUMBER

1745

DATE MAILED: 05/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

3

Office Action Summary

Application No.

09/827,843

Applicant(s)

ONG ET AL.

Examiner

Gregg Cantelmo

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-11 and 16-28 is/are rejected.
- 7) ☒ Claim(s) 12-15 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 April 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: .

DETAILED ACTION

Priority

1. This application is a continuation-in-part of the prior Application No. 09/546,308, filed April 10, 2000, and adds and claims additional disclosure not presented in the prior application.

Information Disclosure Statement

2. The information disclosure statement filed April 5, 2001 has been placed in the application file and the information referred to therein has been considered as to the merits.

Drawings

3. The drawings received April 5, 2001 are acceptable for examination purposes.

4. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the first side of the first interconnect is immediately adjacent said first side of the second interconnect and said second side of the first interconnect is immediately adjacent the second side of the interconnect (claims 19-28) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

5. The disclosure is objected to because of the following informalities: the status of Application No. 09/546,308 (page 1) should be updated to the corresponding U.S. patent and issue date; the status of Application No. 09/419,343, (page 3) should be updated since it has been abandoned. Appropriate correction is required.
6. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: that the first side of the first interconnect is immediately adjacent said first side of the second interconnect and said second side of the first interconnect is immediately adjacent the second side of the interconnect (see item 8 below for further explanation).

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
8. Claims 19-28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 19 recites that the first side of the first interconnect is immediately adjacent said first side of the second interconnect and said second side of the first interconnect is immediately adjacent the second side of the interconnect. However it is not readily understood how this arrangement can be achieved. The first and second interconnects

Art Unit: 1745

11 and 12 are separated by the planar ceramic cell 13. Therefore the interconnects 11 and 12 are never shown to be immediately adjacent each other. Therefore given the fact that the interconnects are not shown to be immediately adjacent to each other, it is unclear how the first side of the first interconnect is immediately adjacent said first side of the second interconnect and said second side of the first interconnect is immediately adjacent the second side of the interconnect.

Prior art teachings cannot be applied to claims 19-28 nor can patentability of claims 19-28 be ascertained without further clarity by Applicant.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1, 2, 4, 6-11 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. patent No. 5,851,689 (Chen).

Chen discloses of a unitized solid oxide fuel cell (Figs. 1 and 3-5), comprising: a planar first interconnect 44 that allows a first gas to flow therein; a planar ceramic cell 42 adjacent said first interconnect 44 (Figs. 1 and 3); a planar second interconnect 44 adjacent said ceramic cell 42 (Figs. 1 and 3), said second interconnect allows a second gas to flow therein; a plurality of gas tubes in gas communication with said ceramic cell, said gas tubes comprising: a first gas inlet 76 affixed to said first interconnect 44; a

second gas inlet 74 affixed to said second interconnect 44; a first gas outlet 92 in communication with said first gas inlet 76; and a second gas outlet 86 in communication with said second gas inlet 74 (Figs. 1 and 3-5 as applied to claim 1).

In particular each interconnect has inlets and outlet lines as shown in Fig. 5.

The gas outlets 86 and 92 comprise tubes affixed to interconnects 44 (Fig. 5 as applied to claim 2).

The gas inlets have cylindrical shape (Fig. 5 as applied to claim 4).

The gas inlets are affixed to middle areas of respective interconnects (Figs. 1 and 3-5 as applied to claim 6).

The first gas inlet comprises a portion 72 which is parallel to portion 70 of the second gas inlet (Fig. 4 as applied to claim 7).

The first gas inlet portion 76 is perpendicular to second gas inlet portion 74 (Fig. 5 as applied to claim 8).

Tube portions 74, 76, 92 and 86 are straight shaped (Fig. 5 as applied to claim 9).

Combined tube portions 74/70, 76/72, 92/94 and 86/84 are T-shaped (Figs. 1, 4 and 5 as applied to claim 10).

The gas tubes have cross member portions 70, 72, 94 and 84 with respective inlet portions 74, 76, 92 and 86 (Fig. 4 as applied to claim 11).

Chen discloses of a unitized solid oxide fuel cell (Figs. 1 and 3-5), comprising: a planar first interconnect 44 that allows a first gas to flow therein; a planar ceramic cell 42 adjacent said first interconnect 44 (Figs. 1 and 3); a planar second interconnect 44

adjacent said ceramic cell 42 (Figs. 1 and 3), said second interconnect allows a second gas to flow therein; a plurality of gas tubes in gas communication with said ceramic cell, said gas tubes comprising: a fuel gas inlet 74 affixed to said first interconnect 44; an oxidant gas inlet 76 affixed to said second interconnect 44; a fuel gas outlet 86 in communication with said first gas inlet 76; and an oxidant gas outlet 92 in communication with said second gas inlet 74 (Figs. 1 and 3-5 as applied to claim 16).

11. Claims 1, 2, 4, 6, 8 and 16-18 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. patent No. 4,476,196 (Poeppel).

Poeppel discloses of a unitized solid oxide fuel cell (Fig. 1), comprising: a planar first interconnect 14 that allows a first gas to flow therein; a planar ceramic cell 40/42/44 (and col. 3, ll. 1=18) adjacent said first interconnect 14 (Figs. 1 and 3); a planar second interconnect 13 adjacent said ceramic cell 40/42/44 (Figs. 1 and 3), said second interconnect allows a second gas to flow therein; a plurality of gas tubes in gas communication with said ceramic cell, said gas tubes comprising: a first gas inlet 34 affixed to said first interconnect 14; a second gas inlet 30 affixed to said second interconnect 13; a first gas outlet 36 in communication with said first gas inlet; and a second gas outlet in communication with said second gas inlet (Figs. 1 and 3 as applied to claim 1).

At least one of said first and second gas outlets comprise a tube affixed to at least one of said first and second interconnects (Fig. 1 as applied to claim 2).

The gas inlets 30 and 34 are cylindrical in shape (Fig. 1 as applied to claim 4).

The first gas inlet 34 is affixed at a middle area of a side of the first interconnect 14 and the second gas inlet 30 is affixed at a middle area of a side of said second interconnect (Fig. 1 as applied to claim 6).

Said first gas inlet is disposed substantially perpendicular to said second gas inlet (Fig. 3 as applied to claim 8).

Poeppel discloses of a unitized solid oxide fuel cell, comprising: a planar first interconnect 13 that allows a fuel to flow therein; a planar ceramic cell adjacent said first interconnect; a planar second interconnect 14 adjacent said ceramic cell 40/42/44, said second interconnect allows an oxidant to flow therein; a plurality of gas tubes in gas communication with said ceramic cell, said gas tubes comprising: a fuel inlet 30 affixed to said first interconnect 13; an oxidant inlet 34 affixed to said second interconnect 14; a fuel outlet affixed to said first interconnect 13; and an oxidant outlet 36 affixed to said second interconnect 14 (Figs. 1 and 2 as applied to claim 16).

The first interconnect 13 includes a first side, a second side, a third side, and a fourth side (Figs. 1 and 3 as applied to claim 17).

The second interconnect 14 includes a first side, a second side, a third side, and a fourth side (Figs. 1 and 3 as applied to claim 18).

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

Art Unit: 1745

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chen in view of U.S. patent No. 6,280,869 (Chen '869).

The teachings of claim 1 with respect to Chen have been discussed above and are incorporated herein.

The difference between claim 3 and Chen is that Chen does not disclose of at least one of the gas outlets comprising a plurality of openings in at least one of the interconnects.

Chen '869 discloses a similar arrangement as taught by Chen. In addition Chen '869 discloses of providing a fuel feed line 74 within separator (interconnect) assemblies 42 (Fig. 2).

The motivation for providing the fuel inlet arrangement of Chen '869 is that it eliminates the need for corrugated separator (interconnect) plates to form flow channels and improve the fuel flow path across the surface of the anode layer (col. 3, ll. 1-32).

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Chen by using the fuel inlet arrangement of Chen '869 having a plurality of openings in at least one of the interconnects since it would have eliminated the need for corrugated separator (interconnect) plates to form flow channels and improved the fuel flow path across the surface of the anode layer.

14. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Poeppel in view of U.S. patent No. 4,476,197 (Herceg).

The teachings of claim 1 with respect to Poeppel have been discussed above and are incorporated herein.

The difference between claim 5 and Poeppel is that Poeppel does not disclose of the first gas inlet affixed adjacent an intersection of two sides of the first interconnect and said second gas inlet affixed adjacent an intersection of two sides of the second interconnect.

Herceg discloses that gas inlets can be affixed adjacent an intersection of two sides of the first interconnect and said second gas inlet affixed adjacent an intersection of two sides of the second interconnect (Fig. 1). This provides an equivalent alternative way for flowing fuel and oxidant through the fuel cell.

In addition the instant application does not set forth any evidence that the configuration recited in claim 5 has any improvements or unexpected results over other inlet placements. Thus this arrangement is interpreted as a rearrangement of the gas inlets. It has been held that a rearranging of parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70.

Therefore it would have been obvious to one of ordinary skill in the art at the time the claimed invention was made to modify the teachings of Poeppel by providing gas inlets can be affixed adjacent an intersection of two sides of the first interconnect and said second gas inlet affixed adjacent an intersection of two sides of the second interconnect as shown by Herceg since it would have provided an equivalent alternative way for flowing fuel and oxidant through the fuel cell and furthermore is held to be a

rearrangement of parts absent any evidence of criticality or unexpected results from such rearrangement of the inlets.

Allowable Subject Matter

15. Claims 12-15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

16. The following is a statement of reasons for the indication of allowable subject matter: none of the prior art of record are considered to teach suggest or render obvious the inventions recited in claims 12-15.

With respect to claim 12: the cross member portion is not taught nor suggested to be disposed within at least one of the interconnects and disposed immediately adjacent the inlet portion. It would not have been obvious to modify Chen in this manner since the cross members span the entire fuel cell stack (i.e. are parallel to the length of the stack) and to incorporate the cross members into the interconnects would require significant reconfiguration of the fuel cells and interconnects to provide the same gas flow as taught by Chen via the cross members while electrically isolating the cross members from the stack to prevent shorting of the cell.

With respect to claim 14: the cross member portion is not taught nor suggested to be disposed within at least one of the interconnects and disposed away from the inlet portion. It would not have been obvious to modify Chen in this manner since the cross members span the entire fuel cell stack (i.e. are parallel to the length of the stack) and

to incorporate the cross members into the interconnects would require significant reconfiguration of the fuel cells and interconnects to provide the same gas flow as taught by Chen via the cross members while electrically isolating the cross members from the stack to prevent shorting of the cell.

17. While no art rejections have been applied to claims 19-28, this is not admission that these claims are patentable. Given the fact that the claimed configuration of claim 19 is not readily understood as recited by the claims and in light of the disclosure of the instant application, no clear determination regarding patentability can be made at this point in prosecution. In addition, upon further clarification of the relationships defined in claims 19-28, application of prior art to claims 19-28 may be applied subsequent to Applicant's response to this office action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is (703) 305-0635. The examiner can normally be reached on Monday through Thursday from 8:00 a.m. to 5:30 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan, can be reached on (703) 308-2383. FAX communications should be sent to the appropriate FAX number: (703) 872-9311 for After Final Responses only; (703) 872-9310 for all other responses. FAXES received after 4 p.m. will not be processed until the following business day. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Application/Control Number: 09/827,843
Art Unit: 1745

Page 12

Gregg Cantelmo
Patent Examiner
Art Unit 1745

gc

A handwritten signature in black ink, appearing to read "Gregg Cantelmo", with a long horizontal flourish extending to the right.

May 21, 2003